

WHAT IS CLAIMED IS:

1           1.       A driver circuit, comprising:  
2               a voltage booster coupled to receive an input voltage and coupled to provide an  
3 output voltage having an increased magnitude relative to the input voltage;  
4               a current source coupled to receive the input voltage and to provide a  
5 substantially constant current in response to the input voltage; and  
6               a component coupled to the voltage booster and the current source, wherein the  
7 voltage booster activates the component using the output voltage and the substantially  
8 constant current.

1           2.       The driver circuit of Claim 1, wherein the voltage booster comprises:  
2               a buffer coupled to provide a charging signal in response to a first polarity of  
3 the input voltage; and  
4               an energy storage device coupled to receive the charging signal to increase a  
5 voltage developed across the energy storage device.

1           3.       The driver circuit of Claim 2, wherein the buffer is further coupled to  
2 provide a driving signal in response to a second polarity of the input voltage, the  
3 driving signal being combined with the voltage developed across the energy storage  
4 device to produce the output voltage.

1           4.       The driver circuit of Claim 1, wherein the current source comprises:  
2               a bias generation circuit coupled to provide a bias voltage in response to the  
3 input voltage; and  
4               a current conduction device coupled to receive the bias voltage and coupled to  
5 provide the substantially constant current in response to the bias voltage.

1           5.       The driver circuit of Claim 4, wherein the bias generation circuit  
2 comprises a series combination of diodes.

1           6.       The driver circuit of Claim 5, wherein the current conduction device  
2 comprises a transistor having a voltage across a control terminal and a conduction  
3 terminal of the transistor substantially equal to a voltage across one of the diodes.

1           7.       The driver circuit of Claim 6 further comprising a current limiting  
2 device, wherein the current limiting device limits the substantially constant current to  
3 be proportional to the voltage across one of the diodes.

1           8.       The driver circuit of Claim 1, wherein the component includes a light  
2 emitting diode (LED) having an illumination state controlled by the voltage booster.

1           9.       The driver circuit of Claim 8, wherein a forward current conducted by  
2 the LED is substantially equal to the substantially constant current.

1           10.      A method of controlling backlighting associated with a display,  
2 comprising:  
3           storing charge from a power source in a first phase of operation when a bias  
4 voltage supplying at least one Light Emitting Diode (LED) is less than a forward  
5 voltage required by the LED, wherein the power source provides a voltage level lower  
6 than the forward voltage required by the LED;  
7           in a second phase of operation, combining an operating voltage with the stored  
8 charge to illuminate the LED using the combined voltage as the bias voltage; and  
9           alternating the first and second phases of operation to control the backlighting  
10 associated with the display.

1           11.      The method of Claim 10, wherein storing charge comprises providing a  
2 charging signal from the power source to an energy storage device by conducting the  
3 charging signal using a driver.

1           12.      The method of Claim 11, where the driver conducts the charging signal  
2 in response to a first polarity of an illumination signal.

1           13.      The method of Claim 12, wherein the operating voltage is provided by  
2 the driver operating in response to a second polarity of the illumination signal.

1           14.      The method of Claim 10, wherein the LED is non-luminescent in the  
2 first phase of operation.

1           15.     The method of Claim 14, wherein the LED is luminescent in the second  
2     phase of operation.

3           16.     The method of Claim 15, wherein a perceived intensity of the LED is  
4     proportional to a duty cycle formed by the second phase and the first phase.

1           17.     An environmental control system, comprising:  
2             a display controller coupled to the environmental control system to provide  
3     display information;  
4             a thermostat comprising an LCD coupled to receive the display information, and  
5     an LCD backlight system coupled to the LCD, the LCD backlight system comprising:  
6                 a voltage booster coupled to receive a lighting control signal and  
7     coupled to provide an output signal having an increased magnitude of the lighting  
8     control signal;  
9                 a current source coupled to receive the lighting control signal and  
10    coupled to provide a substantially constant current in response to the lighting control  
11    signal; and  
12                 a Light Emitting Diode (LED) coupled to the voltage booster and the  
13    current source, wherein the voltage booster activates the LED using the output signal  
14    and the substantially constant current.

1           18.     The environmental control system of Claim 17, wherein the voltage  
2     booster comprises:  
3             a buffer coupled to provide a charging signal in response to a first polarity of  
4     the lighting control signal; and  
5             an energy storage device coupled to receive the charging signal to increase a  
6     voltage developed across the energy storage device.

1           19.     The environmental control system of Claim 18, wherein the buffer is  
2     further coupled to provide a driving signal in response to a second polarity of the  
3     lighting control signal, the driving signal being combined with the voltage developed  
4     across the energy storage device to produce the output signal.

1           20.     The environmental control system of Claim 17, wherein the current  
2 source comprises:

3           a bias generation circuit coupled to provide a bias voltage in response to the  
4 lighting control signal; and

5           a current conduction device coupled to receive the bias voltage and coupled to  
6 provide the substantially constant current in response to the bias voltage.

1           21.     The environmental control system of Claim 20, wherein the bias  
2 generation circuit comprises a series combination of diodes.

1           22.     The environmental control system of Claim 21, wherein the current  
2 conduction device comprises a transistor, wherein a voltage across a control terminal  
3 and a conduction terminal of the transistor is substantially equal to a voltage across one  
4 of the diodes.

1           23.     The environmental control system of Claim 22 further comprising a  
2 current limiting device, wherein the current limiting device limits the substantially  
3 constant current to be proportional to the voltage across one of the diodes.

1           24.     The environmental control system of Claim 17, wherein a forward  
2 current conducted by the LED is substantially equal to the substantially constant  
3 current.

1           25.     A method of controlling a luminescent state of a Light Emitting Diode  
2 (LED), comprising:  
3           receiving an input signal;  
4           boosting the input signal to form a boosted signal;  
5           generating a substantially constant current from the input signal; and  
6           applying the boosted signal and the substantially constant current to illuminate  
7 the LED.

1           26.     The method of Claim 25, wherein boosting the input signal comprises:  
2           generating a charging signal in response to a first phase of the input signal; and  
3           increasing a potential stored across an energy storage device in response to the  
4           charging signal.

1           27.     The method of Claim 26, wherein boosting the input signal further  
2           comprises combining the input signal with the potential stored across the energy  
3           storage device in response to a second phase of the input signal.

1           28.     The method of Claim 27, wherein generating a substantially constant  
2           current comprises:  
3           forming a bias signal in response to the second phase of the input signal; and  
4           inducing a conductive state of a current control device in response to the bias  
5           signal, wherein the substantially constant current is proportional to the bias signal.

1           29.     A Light Emitting Diode (LED) control circuit, comprising:  
2           means for charging an energy storage device during a first phase of operation of  
3           the LED control circuit; and  
4           means for discharging the energy storage device during a second phase of  
5           operation of the LED control circuit to illuminate an LED, wherein means for  
6           discharging the energy storage device comprises:  
7                 means for summing the charge stored in the energy storage device with  
8                 an illumination signal; and  
9                 means for supplying a constant current during the second phase of  
10          operation.

1           30.     The LED control circuit of Claim 29, wherein the means for summing  
2           the charge stored comprises means for blocking the power supply to induce a control  
3           voltage greater than a magnitude of the power supply.